Geophysical Research Abstracts
Vol. 20, EGU2018-14455, 2018
EGU General Assembly 2018

Seasonal vs. depth recording biases in planktonic foraminifera proxies: insights from a sediment trap time series from the northern North Atlantic.

Lukas Jonkers (1), Runa Reuter (2), Geert-Jan Brummer (3), and Michal Kucera (1)

(1) MARUM Center for Marine Environmental Science, University of Bremen, Germany, (2) University of Bremen, Germany, (3) Royal NIOZ, Den Hoorn, The Netherlands

Planktonic foraminifera are the most important proxy carriers in paleoceanography, yet variable seasonal and depth biases in their recording remain a serious challenge to the interpretation of their sedimentary record. Importantly, our understanding of how their ecology is affected by climate is still incomplete, necessitating studies investigating modern planktonic foraminifera. Moreover, despite the fact that the North Atlantic is overrepresented in paleoceanographic studies, research on modern planktonic foraminifera in that region remains relatively scarce.

To address this gap in our knowledge, we here report shell fluxes and stable oxygen and carbon isotopes of *Neogloboquadrina incompta* and *Globigerinita glutinata* from a sediment trap time series from the Irminger Sea. These two species show clearly different patterns in their seasonality, with *G. glutinata* displaying a bimodal flux pattern with major pulse in June, when surface stratification starts to develop and a secondary flux pulse later in the year when winter mixing begins. Shell fluxes of *N. incompta* on the other hand show a single peak around the sea surface temperature maximum in late summer. These flux patterns fit with the global patterns of seasonality of these species (Jonkers and Kučera, 2015) and confirm the applicability of a recently proposed empirical model seasonality model (Jonkers and Kučera, 2017). The stable oxygen isotope ratios indicate a near surface calcification depth for both species that is similar to that of *N. pachyderma* at the same site (Jonkers et al., 2010). The similarity in the calcification depths among these species indicates that any difference in their sedimentary proxy signal is due to differing seasonal, rather than depth, biases in their recording.

Jonkers, L., Brummer, G.-J. A., Peeters, F. J. C., van Aken, H. M., and De Jong, M. F.: Seasonal stratification, shell flux, and oxygen isotope dynamics of left-coiling *N. pachyderma* and *T. quinqueloba* in the western subpolar North Atlantic, Paleoceanography, 25, PA2204; 2210.1029/2009PA001849, 2010.

Jonkers, L., and Kučera, M.: Global analysis of seasonality in the shell flux of extant planktonic Foraminifera, Biogeosciences, 12, 2207-2226, 10.5194/bg-12-2207-2015, 2015.

Jonkers, L., and Kučera, M.: Quantifying the effect of seasonal and vertical habitat tracking on planktonic foraminifera proxies, Clim. Past, 13, 573-586, 10.5194/cp-13-573-2017, 2017.